CLAIMS:

Sub A1 1. A discriminator for an electromagnetic signal moving in a direction along a path, the discriminator comprising:

a photodetector having an active region and at least one interference coating adapted for lying along the path and adapted for having the electromagnetic signal incident thereon, said interference coating adapted for apportioning the electromagnetic signal into a first sub-signal adapted for transmitting through said interference coating and to said active region and a second sub-signal adapted to be reflected by said interference coating.

2. The discriminator according to claim 1, wherein the second subsignal is adapted to be incident on said interference coating at an oblique angle.

3. The discriminator according to claim 1, wherein the photodetector and the interference coating are monolithic.

4. The discriminator according to claim 1, wherein the interference coating is grown on an atomic level to form a part of said discriminator.

5. The discriminator according to claim 1, wherein said interference coating is adapted to apportion the electromagnetic signal based on at least one of electromagnetic signal power, electromagnetic signal wavelength, and electromagnetic signal polarization.

6. The discriminator according to claim 1, wherein a set of interference coatings define a Fabry-Perot filter.

7. A directional discriminator system for electromagnetic radiation including at least one first wavelength and at least one second wavelength, the directional discriminator comprising:

a detector having an interference coating adapted for reflecting the at least one first wavelength and adapted for transmitting the at least one second wavelength, said detector having an absorbing region adapted for converting to electrical energy the at least one second wavelength transmitted through said interference coating; and

a source adapted for emitting the first wavelength at an oblique angle with respect to said interference coating; wherein said source is adapted for emitting the first wavelength so as to be incident on said interference coating and to be reflected by said interference coating.

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8. The directional discriminator system according to claim 7, wherein said interference coating is of the type described as dichroic, bandpass, edge, notch, or comb, whereby said interference coating is adapted to at least partially reflect the at least one first wavelength and adapted to at least partially transmit the at least one second wavelength.

9. The directional discriminator system according to claim 8, wherein said interference coating is adapted for reflecting at least 90% of the first wavelength and adapted for transmitting at least 60% of second the wavelength.

10. The directional discriminator system according to claim 8, wherein said interference coating is substantially polarization independent at said oblique angle.

11. The directional discriminator system according to claim 7, wherein said oblique angle is 45 degrees.

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12. The directional discriminator system according to claim 7, wherein said source is a laser.

13. The directional discriminator system according to claim 7, wherein said detector is a PIN diode photodetector.

14. The directional discriminator system according to claim 7, further comprising a lens interposed between said source and said discriminator, said lens adapted to focus the at least one first wavelength onto said interference coating.

15. The directional discriminator system according to claim 7, further comprising a lens adapted to focus the at least one second wavelength onto said interference coating.

16. The directional discriminator system according to claim 7, further comprising at least one modifying element adapted to be disposed in a beam of electromagnetic radiation, said modifying element being selected from the group consisting of at least one of a birefringent wave plate, a Faraday rotator, and a polarizing element.

17. A bi-directional optical transmission and reception arrangement, comprising:

an optical transmitter having a transmitter exit pupil for the emission of an optical radiation having a first wavelength;

an optical discriminator having a receiver absorbing region for the reception of optical radiation having a second wavelength;

an optical delivery means for delivering the radiation having the first wavelength emitted from the transmitter exit pupil to a first spatial point at a distance from the transmitter exit pupil and from the receiver absorbing region and for delivering radiation having a second wavelength emitted from a second spatial point in the vicinity of the first spatial point to the receiver absorbing region; and

an optical shielding means for shielding the receiver absorbing region against the radiation having the first wavelength,

wherein said shielding means is a wavelength-selective optical filter physically disposed on or within said optical discriminator, said optical filter being non-transmissive for the first wavelength and transmissive for the second wavelength.

18. The arrangement according to claim 17, wherein the optical delivery means comprises an optical lens disposed between the optical shielding means and said spatial points.

19. The arrangement according to claim 17, wherein the optical transmitter is composed of a laser diode having an optical waveguide, said waveguide comprising an end face that faces toward the optical shielding means and defines the transmitter exit pupil.

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20. The arrangement according to claim 17, wherein said optical discriminator is arranged to provide a rangefinding function.

21. The arrangement according to claim 17, wherein said optical discriminator is arranged to provide a free space communication function.

22 ~~21~~. The arrangement according to claim 17, wherein said optical discriminator is arranged to provide a transmitter output monitoring function.

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23 ~~21~~. The arrangement according to claim 17, wherein said optical shielding means comprises an optical interference coating deposited onto the optical detector.

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24 ~~22~~. The arrangement according to claim 17, wherein said optical shielding means comprises an interference coating grown on an atomic level to form a part of said optical discriminator.

25 ~~23~~. The arrangement according to claim 17, wherein said optical shielding means comprises a set of interference coatings defining a Fabry-Perot filter.

ABSTRACT OF THE DISCLOSURE

A bi-directional communication assembly is provided with commonly available optoelectronic components in a compact package. Diplex functionality is achieved by orienting the receiving detector at an angle with respect to the transmitting beam. An interference coating inside the detector, on the detector surface, or on a surface in intimate contact with the detector, reflects the transmitted beam while simultaneously allowing the receiving beam to pass through the coating to the light absorbing region. The combined function of the receiving detector, providing advantages of a common beam path and close proximity of the components, enable a compact package that can be placed within the space usually occupied by the transmitter light source alone.